

## CLAIMS

What is claimed is:

1. A method to control changes in a flying height between a write head and a disk surface of a hard disk drive, comprising:
  - changing a write current or an overshoot value of the write current in relation to a temperature;
  - determining whether the write head and the disk surface of the hard disk drive are in contact in relation to the changed write current or the changed overshoot value of the write current; and
  - setting the write current and the overshoot value of the write current as a threshold upon determining that the head and disk surface are in contact.
2. The method according to claim 1, wherein when changing the write current or the overshoot value of the write current, the magnitude of the write current is changed in accordance with changes in temperature and the overshoot value is changed at each magnitude of the write current.
3. The method according to claim 1, wherein determination of whether the write head and the disk surface of the hard disk are in contact is performed via analysis of a signal sensed by an acoustic emission sensor mounted on the pivot side of the hard disk.
4. An apparatus to control changes in a flying height between a write head and a disk surface of a hard disk drive, comprising:
  - a write current control unit to control the magnitude of a write current provided to the head of the hard disk drive in accordance with changes in temperature;
  - an overshoot control unit to change an overshoot value of the write current at each magnitude of the write current;
  - a signal analyzing unit to determine whether the head and the disk surface of the hard disk drive are in contact in relation to the changes of the write current controlled via the write current control unit, and changes of the overshoot value of the write current controlled via the overshoot control unit; and

a threshold storing unit to store thresholds of the write current and the overshoot value analyzed via the signal analyzing unit.

5. The apparatus according to claim 4, further comprising:

an acoustic emission sensor mounted on a pivot of the hard disk drive to sense a vibration signal generated due to contact between the head and the disk surface as a result of a magnetic field generated when the write current is provided to the head.

6. A computer readable medium having embodied thereon a computer program to perform a method, comprising: ✓

changing a write current or an overshoot value of the write current in relation to a temperature;

determining whether a head and a disk surface of a hard disk drive are in contact in relation to changes of the write current or the overshoot value of the write current; and

setting the write current and the overshoot value of the write current as a threshold upon determining that the head and disk surface are in contact.

7. A method to control changes of a flying height between a write head and a disk, comprising: ✓

detecting and analyzing a signal of frictional vibration between the disk and the head of the hard disk drive; and

setting a magnitude of the write current and the overshoot value of the write current upon detecting and analyzing the signal of frictional vibration.

8. The apparatus according to claim 4, further comprising:

an acoustic emission sensor to sense a signal of frictional vibration between the disk and the head.

9. The apparatus according to claim 8, wherein the acoustic emission sensor converts a mechanical signal inside the hard disk into an electric signal.

10. The apparatus according to claim 4, wherein the overshoot control unit controls an overshoot occurring during a transient response of the write current.

11. The apparatus according to claim 4, wherein the signal analyzing unit receives a signal in relation to contact between the disk and the head via the acoustic emission sensor mounted on the pivot of the hard disk drive.

12. The method according to claim 1, wherein the threshold of the write current and the overshoot value of the write current are stored.

13. The apparatus according to claim 4, further comprising:  
a temperature sensor to sense temperature.

14. The apparatus according to claim 13, wherein the threshold storing unit stores the temperature sensed via the temperature sensor.

15. A method to control changes in a flying height between a write head and a disk, comprising:

changing a magnitude of a write current in relation to a temperature;  
changing an overshoot value in relation to each magnitude change of the write current;  
sensing changes of the head and the disk;  
analyzing the changes of the head and the disk to determine whether the disk and the

head are in contact; and

setting the write current and the overshoot value of the write current as threshold upon determining that the disk and the head are in contact.

16. The method according to claim 15, wherein the acoustic emission sensor senses each changing magnitude of the write current at each temperature variation.

17. An apparatus to control changes of a flying height between a write head and a disk, comprising:

an acoustic emission sensor to detect and analyze a signal of frictional vibration between the disk and the head of the hard disk drive; and

a threshold unit to set and store magnitude of the write current and the overshoot value of the write current upon detecting and analyzing the signal of frictional vibration.